S8 - Rotor and structural dynamics in turbomachines

Organizers: Tsuyoshi Inoue, Jaroslav Zapomel & Yusuke Watanabe

Modern advanced turbomachines play an important role in industry, transport and energy transfer. To overcome numerous and various challenges, such as cost reduction, higher performance and efficiency, lower energy losses, operation in adverse conditions or prolongation of the service life, research into the dynamical behavior of rotor system for high reliability and safety is critically important. This session targets all areas and aspects of rotor and structural dynamics in machinery, such as modeling, prediction and control of its dynamical behavior. Both laboratory investigations and field case studies are welcomed. Their approaches could be analytical, numerical or experimental.

Non-exhaustive list of suggested topics

The topics of interest include, but are not limited to:

Vibration reduction, dynamical stability, self-excitation, nonlinear behavior and tools for its evaluation, optimal design, balancing, diagnostics, identification and condition monitoring, interactions and coupling phenomena (e.g., interaction of rotors with the stationary part and the foundations, torsion-bending oscillation, fluid-structure interaction, electro-mechanical couplings, other multi-physics phenomena), service life prediction, uncertainties and operation reliability, active/passive control, application of smart and advanced materials in design of rotating machines, energy harvesting, fluid film, rolling element, magnetic bearing, superconducting bearings, blades and bladed discs, gears and gear systems, micro and nano rotating devices, progressive modelling and experimental methods, computational simulation methods, practical applications and case studies (turbochargers, steam, gas, wind and water turbines and generators, and so on).

Organizers

Tsuyoshi Inoue is a Professor with the Department of Mechanical Systems Engineering, Nagoya University. He received B.S., M.S., and Ph.D. degrees in Electric-Mechanical engineering from Nagoya University of Nagoya, Japan. His research interests include nonlinear dynamics, rotor dynamics, vibration analysis and fault diagnostics, vibration control, and dynamics of fluid-structure interaction.

Jaroslav Zapoměl is a Professor at the Department of Applied Mechanics of the VSB - Technical University of Ostrava and at the Department of Dynamics and Vibration of the Institute of Thermomechanics in Prague. He received his scientific and academic degrees at the Technical University of Ostrava and the Brno University of Technology. His research interests include rotor dynamics, semi-active controllable rotor support elements using smart lubricants, nonlinear vibration, material damping, application of advanced materials in mechanical systems.

Yusuke Watanabe is working as a researcher at EBARA Corporation, Japan. He received Ph.D. degree in Mechanical Engineering from Kansai University, Japan. His research interests include rotor dynamics, self-excited vibration, dynamics of fluid-structure interaction, diagnosis method and industrial use of these technologies.

Contacts

inoue.tsuyoshi@nagoya-u.jp

jaroslav.zapomel@vsb.cz

watanabe.yusuke@ebara.com